REMARKS

Claims 1-24 were pending and rejected in the above-identified patent application. Claims 23 and 24 are being canceled. Claims 1-22 remain pending. No new matter is being added.

Applicant would like to thank Examiner Klinger for the many telephone conversations to discuss the current claims and the cited references. Applicant provides a summary of our interview discussions below.

The Examiner rejected claims 23 and 24 under 35 USC § 102 as unpatentable over Carter. Claims 23 and 24 are being canceled without prejudice to focus discussions on claims 1-22.

The Examiner rejected claims 1-8 and 10 under 35 USC § 103 as obvious over Ofek in view of Sicola. Ofek describes two data storage systems interconnected by a data link for remote mirroring. As acknowledged by the Examiner, Ofek does not show a heartbeat signal. Sicola describes a data replication system that implements heartbeat signals between storage controllers, e.g., between local array controller A1 and remote array controller B1. See col. 9 lines 31-67.

The Examiner specifically states that "Given these teachings, a person of ordinary skill in the art would have readily recognized the desirability and advantages of modifying the system of Ofek so as to use a copy mechanism for the heartbeat, such as taught by Sicola, in order to check if the disks are operational."

However, claim 1 requires "the first host group configured to selectively send a heartbeat signal to the second host group by use of the remote link by sending a memory command to the first storage system which is mirrored via the remote link using a remote copy mechanism to the second storage system." Neither Ofek nor Sicola teaches sending the host's heartbeat signals via the remote copy link of the data storage subsystem. Accordingly, whether or not it would be obvious to combine Ofek and Sicola to generate a disk's heartbeat signal over a remote copy mechanism, as argued by the Examiner, claim 1 is limited to sending the host's heartbeat signal over the remote copy mechanism. Applicant respectfully submits that the Examiner has not

established a prima facie case, and respectfully submits that Claim 1 and claims 2-8 and 10 which include a limitation similar to that of claim 1 are patentable over Ofek in view of Sicola, for at least these reasons.

The Examiner rejected claims 9 and 11-22 under 35 USC § 103 as obvious over Carter in view of Sicola. Carter describes a cluster manager that determines whether a server of a current subcluster is available based upon heartbeat signals transmitted among the servers of the server cluster. Carter describes sending heartbeat signals over a WAN. Carter specifically states, "Moreover, the WAN 104 is generally operable to provide a communications link between the geographically distributed subclusters 112A, 112B, ... 112Z of the server cluster 106." Carter does not describe a remote link coupled between the first storage system associated with the first host group and the second storage system associated with the second host group. As is clear from Fig. 1 of Carter, WAN 104 is not a remote link between the first storage system and the second storage system. The Examiner agrees that Carter is silent on how the storage systems heartbeat signal is sent. As stated above, Sicola describes a data replication system that implements heartbeat signals between storage controllers.

Again, the Examiner specifically states that "Given these teachings, a person of ordinary skill in the art would have readily recognized the desirability and advantages of modifying the system of Carter so as to use a copy mechanism for the heartbeat, such as taught by Sicola, in order to check if the disks are operational."

However, claim 9 requires "the production host group configured to selectively send a heartbeat signal to the standby host group by use of the remote mirror, the heartbeat signal being sent from a first storage system associated with the production host group via the remote mirror to a second storage system associated with the standby host group using a remote copy mechanism." Neither Carter nor Sicola teaches sending host heartbeat signals via the remote mirror of the data storage subsystem. Accordingly, whether or not it would be obvious to combine Carter and Sicola to generate a disk's heartbeat signal over a remote copy mechanism, as argued by the Examiner, claim 1 is limited to sending the host's heartbeat signal over the remote copy mechanism. Applicant respectfully submits that the Examiner has not established a prima facie case, and respectfully submits that claim 9, claims 11 and 17 which include

limitations similar to that of claim 9, claims 12-16 which depend from claim 11, and claims 18-22 which depend from claim 17 are thus patentable over Carter in view of Sicola, for at least these reasons.

Applicant respectfully submits that claims 1-22 are patentable, and respectfully requests a notice of allowance.

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Respectfully submitted,

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